Nome River Salmon Counting Weir
Project Summary Report, 1998

by

Peter J. Rob

Alaska Department of Fish & Game
Commercial Fisheries Division, AYK Region
333 Raspberry Road
Anchorage, Alaska 99518-1599

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The Nome River drains into Norton Sound approximately three miles east of Nome. Commercial fishing has been progressively reduced through regulatory restrictions since the late 1970s and the marine waters near the mouth were closed in 1984. The Nome River currently supports a large number of subsistence and sport users, however, their fishing opportunities generally continue to decrease as low numbers of salmon return to the river most years. The subsistence and sport fisheries are now managed at a level of intensity similar to a commercial fishery, with Emergency Orders regulating restrictions and fishing periods.

A salmon counting tower was operated on the Nome River starting in 1993 (Bue 1994, Rob 1995a and 1995b). A weir replaced the counting tower beginning in 1996. This was the third year of weir operation (Rob 1997 and 1998). The returns of chum, pink, king, and coho salmon and of Dolly Varden were counted. The project operates as a means to obtain timely and accurate escapement information that is required to actively manage the stocks throughout the season.

OBJECTIVES

1. Obtain daily and seasonal estimates of the timing and magnitude of the salmon escapement by species to the Nome River.

2. Obtain daily and seasonal estimates of the timing and magnitude of the Dolly Varden escapement to the Nome River.

METHODS

The Nome River tower camp is approximately 3 miles upstream from the mouth of the river, on land leased to the Alaska Department of Fish & Game (ADF&G) by the Sitnasuak Native Corporation (Figure 1). In 1997 the project site was moved approximately ½ mile downstream from the previous counting tower site. The new site is wider, shallower and better suited for weir operations.

The crew began working on 29 June, 1998. After inventorying equipment and purchasing supplies, they ferried equipment to the project site by truck and jet boat. The camp was then established. A full weir was built to completely block the river to fish passage. A gate was installed in the weir to allow fish passage and enumeration. The weir was made of a series of 1¼" pipes assembled in pairs using locking metal brackets. Aluminum stringers twelve feet long connected the pairs of pipes horizontally. Metal conduit pipes ten feet long were inserted vertically in holes 1¾ inches on center on the stringers. This

formed a weir designed to be easily cleaned, fish tight and easily removed in the event of a flash flood.

The crew traveled to Nome for their days off and also to pick up groceries, supplies and mail. Nome office staff transported the crew to and from the Nome River highway bridge and provided other logistical support.

RESULTS

Table 1 shows the daily and cumulative weir passage for each species.

The total cumulative weir counts were: 1,930 chum salmon, 359,469 pink salmon, 70 king salmon, 96 coho salmon, and 137 Dolly Varden (Table 1). Figures 2-11 show graphs of the daily the cumulative totals for each species counted.

Counting began on 1 July. Pink salmon and Dolly Varden were first observed on 2 July, chum salmon were first observed on 3 July, king salmon were first observed on 6 July, and coho salmon were first observed on 10 July (Table 1). The daily peak of 570 chum salmon occurred on 11 July, the daily peak of 27 king salmon occurred on 11 July, the daily peak of 58,742 pink salmon occurred on 21 July, the daily peak of 56 coho salmon occurred on 11 August, and the daily peak of 45 Dolly Varden occurred on 11 July (Table 1). Most chum salmon returned during the three week period from 11 July through 31 July when 89% passed the weir (Table 1 and Figures 2 and 3). Most pink salmon returned during the three week period from 11 July through 31 July when 97% passed the weir (Table 1 and Figures 4 and 5). Most king salmon returned during the two day period from 11 July through 12 July when 69% passed the weir (Table 1 and Figures 6 and 7). Most coho salmon returned during the last two days of weir operation when 71% passed the weir (Table 1 and Figures 8 and 9). Most Dolly Varden returned during the two week period from 10 July through 23 July when 75% passed the weir (Table 1 and Figures 11 and 12).

A peak aerial survey count of 335 chum salmon was made on 20 July, 1998. The total season weir count of chum salmon was 1,930 (Table 1). The peak aerial survey counted 17% of the total season weir count of chum salmon. The peak aerial survey counted 300 chum salmon above the weir on 20 July, when the cumulative weir count of chum salmon was 1,267 (Table 1). The peak aerial survey counted 24% of the cumulative weir count on 20 July.

A peak aerial survey count of 179,680 pink salmon was made on 20 July, 1998. The total season weir count of pink salmon was 359,469 (Table 1). The peak aerial survey counted 50% of the total season weir count of pink salmon. The peak aerial survey counted 151,680 pink salmon above the weir on 20 July, when the cumulative weir count of pink salmon was 224,304 (Table 1). The peak aerial survey counted 68% of the cumulative weir count on 20 July.

Climatological and stream observations are shown in Table 2.

DISCUSSION

This was the sixth consecutive year of operation for an escapement project on the Nome River. During the first four years the project site was approximately ½ mile upstream of the current site at a location better suited to operation of a counting tower. River conditions this year were generally good until 11 August when the counting season ended because of high water (Table 4).

When counting ceased on August 11 because of high water, pickets were not pulled from the weir. The weir was rolled over by high water and the large number of pink salmon carcasses that came down river with the flood. After the water levels dropped it took a week to retreive the weir from the river.

The Nome River counting tower operated from 25 July to 28 August in 1993. Comparisons between the 1993 and 1998 data can be made for the period from 25 July through 11 August. The escapements of all species were greater during this time period in 1993. From 25 July to 11 August in 1998 the weir count of chum salmon was 360, during the same time period in 1993 the expanded tower count was 1,283 chum salmon. The 1998 weir count of even year pink salmon is not comparable to the 1993 tower count of odd year pink salmon. From 25 July to 11 August in 1998 the weir count of king salmon was 6, during the same time period in 1993 the expanded tower count was 48 king salmon. In 1998 the weir count of coho salmon during this time period was 92, during the same time period in 1993 the expanded tower count was 3,512 coho salmon. In 1998 the weir count of Dolly Varden during this time period was 16, during the same time period in 1993 the expanded tower count was 359 Dolly Varden (Table 1, Figures 12-17, and Bue 1994).

The Nome River counting tower operated from 24 June to 15 August 1994. Comparisons between the 1994 and 1998 data can be made for the period from 1 July through 11 August. The escapements of chum salmon, coho salmon and Dolly Varden were less and the escapements of pink and king salmon were greater in 1998. From 1 July to 11 August in 1998 the weir count of chum salmon was 1,930, during the same time period in 1994 the expanded tower count was 2,893 chum salmon. In 1998 the weir count of pink salmon during this time period was 359,469, during the same time period in 1994 the expanded tower count was 141,205 pink salmon. In 1998 the weir count of king salmon during this time period was 70, during the same time period in 1994 the expanded tower count was 54 king salmon. In 1998 the weir count of coho salmon during this time period was 96, during the same time period in 1994 the expanded tower count was 684 coho salmon. In 1998 the weir count of Dolly Varden during this time period was 137, during the same time period in 1994 the expanded tower count was 170 Dolly Varden (Table 1, Figures 12-17, and Rob 1995a).

The Nome River counting tower operated from 22 June to 6 September in 1995. Comparisons between the 1995 and 1998 data can be made for the period from 1 July through 11 August. The escapements of chum salmon, coho salmon and Dolly Varden were less and the escapements of king salmon were greater in 1998. The 1998 weir count of even year pink salmon is not comparable to the 1995 tower count of odd year pink salmon. From 1 July to 11 August in 1998 the weir count of chum salmon was 1,930, during the same time period in 1995 the expanded tower count was 4,982 chum salmon. In 1998 the weir count of king salmon during this time period was 70, during the same time period in 1995 the expanded tower count was 5 king salmon. In 1998 the weir count of coho salmon during this time period was 96, during the same time period in 1995 the expanded tower count was 243 coho salmon. In 1998 the weir count of Dolly Varden during this time period was 137, during the same time period in 1995 the expanded tower count was 623 Dolly Varden (Table 1, Figures 12-17, and Rob 1995b).

The Nome River weir operated from 26 June to 23 July in 1996. Comparisons between the 1996 and 1998 data can be made for the period from 1 July through 23 July. The escapements of pink salmon, king salmon and Dolly Varden were greater and the escapement of chum and coho salmon was less in 1998. From 1 July to 23 July in 1998 the weir count of chum salmon was 1,495, during the same time period in 1996 the expanded tower count was 3,327 chum salmon. In 1998 the weir count of pink salmon during this time period was 331,200, during the same time period in 1996 the expanded tower count was 95,681 pink salmon. In 1998 the weir count of king salmon during this time period was 62, during the same time period in 1996 the expanded tower count was 5 king salmon. In 1998 the weir count of coho salmon during this time period was 4, during the same time period in 1996 the expanded tower count was 66 coho salmon. In 1998 the weir count of Dolly Varden during this time period was 112, during the same time period in 1996 the expanded tower count was 15 Dolly Varden (Table 1, Figures 12-17, and Rob 1997).

The Nome River weir operated from 27 June to 27 August in 1997. Comparisons between the 1997 and 1998 data can be made for the period from 1 July through 11 August. The escapements of king salmon and coho salmon were greater and the escapements of chum salmon and Dolly Varden was less in 1998. The 1998 weir count of even year pink salmon is not comparable to the 1997 weir count of odd year pink salmon. From 1 July to 11 August in 1998 the weir count of chum salmon was 1,930, during the same time period in 1997 the expanded tower count was 4,781 chum salmon. In 1998 the weir count of king salmon during this time period was 70, during the same time period in 1997 the expanded tower count was 17 king salmon. In 1998 the weir count of coho salmon during this time period was 96, during the same time period in 1997 the expanded tower count was 68 coho salmon. In 1998 the weir count of Dolly Varden during this time period was 137, during the same time period in 1997 the expanded tower count was 299 Dolly Varden (Table 1, Figures 12-17, and Rob 1998).

ACKNOWLEDGEMENTS

The Norton Sound Economic Development Corporation (NSEDC) provided and funded a college intern to be a member of the crew. The crew leader for the season was Erin Lillie. Vaughn Munn, the NSEDC intern was the second crewmember. Benjamin Eakon Jr. was a crewmember for two weeks in July. Dennis Bahnke and Ben Rowe asssisted during the last week of operation. Bill Cavaney and Gary Knuepfer assisted in removing the weir from the river after the water levels went down in late August. A draft of this report was reviewed by Larry Buklis.

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Table 1. Daily weir passage of all salmonid species at the Nome River weir, Norton Sound, 1998.

	Daily chum salmon	Cumulative chum salmon	Daily pink salmon	Cumulative pink salmon	Daily king salmon	Cumulative king salmon	Daily coho salmon	Cumulative coho salmon	Daily Dolly Varden	Cumulative Dolly Varden
1-Jul	0	0	0	0	0	0	0	0	0	0
2-Jul	0	0	38	38	0	0	0	0	3	3
3-Jul	4	4	36	74	0	0	0	0	4	7
4-Jul	1	5	29	103	0	0	0	0	0	7
5-Jul	3	8	9	112	0	0	0	0	0	7
6-Jul	24	32	42	154	1	1	0	0	0	7
7-Jul	3	35	33	187	0	1	0	0	0	7
8-Jul	18	53	108	295	0	1	0	0	2	9
9-Jul	12	65	126	421	0	1	0	0	0	9
10-Jul	36	101	94	515	2	3	2	2	2	11
11-Jul	570	671	27,106	27,621	27	30	0	2	45	56
12-Jul	67	738	53,835	81,456	21	51	0	2	20	76
13-Jul	32	770	3,524	84,980	0	51	0	2	2	78
14-Jul	42	812	17,843	102,823	0	51	0	2	0	78
15-Jul	4	816	967	103,790	0	51	0	2	0	78
16-Jul	108	924	9,769	113,559	1	52	0	2	5	83
17-Jul	51	975	26,155	139,714	2	54	0	2	5	88
18-Jul	27	1,002	5,967	145,681	2	56	0	2	2	90
19-Jul	192	1,194	49,783	195,464	2	58	0	2	1	91
20-Jul	73	1,267	28,840	224,304	0	58	0	2	0	91
21-Jul	126	1,393	58,742	283,046	0	58	0	2	14	105
22-Jul	102	1,495	38,452	321,498	4	62	2	4	6	111
23-Jul	63	1,558	9,702	331,200	0	62	0	4	1	112
24-Jul	12	1,570	159	331,359	1	63	0	4	0	112
25-Jul	12	1,582	119	331,478	1	64	1	5	0	112
26-Jul	33	1,615	1,565	333,043	2	66	0	5	0	112
27-Jul	37	1,652	1,437	334,480	0	66	1	6	3	115
28-Jul	34	1,686	3,310	337,790	1	67	1	7	3	118
29-Jul	15	1,701	4,030	341,820	1	68	1	8	0	118
30-Jul	32	1,733	3,795	345,615	0	68	0	8	2	120
31-Jul	84	1,817	3,200	348,815	1	69	2	10	1	121
1-Aug	40	1,857	5,680	354,495	0	69	3	13	0	121
2-Aug	7	1,864	584	355,079	1	70	2	15	0	121
3-Aug	6	1,870	1,030	356,109	0	70	1	16	0	121
4-Aug		1,870		356,109		70		16		121
5-Aug	1	1,871	227	356,336	0	70	0	16	0	121
6-Aug	10	1,881	626	356,962	0	70	1	17	0	121
7-Aug	6	1,887	403	357,365	0	70	5	22	7	128
8-Aug	8	1,895	411	357,776	0	70	2	24	0	128
9-Aug	7	1,902	785	358,561	0	70	4	28	8	136
10-Aug	8	1,910	512	359,073	0	70	12	40	1	137
11-Aug	20	1,930	396	359,469	0	70	56	96	0	137

Table 2. Climatological observations at the Nome River weir, Norton Sound, 1998.

Date	Time	Air Temp °C	Water Temp °C	% Cloud Cover	Water Guage (inches)	Water Visibility	Remarks
1-Jul	9:00	37		100%		Clear	
2-Jul	21:00	40		100%	24.0	Clear	
3-Jul	0:00	45		95%	24.0	Clear	
4-Jul	22:00	57		10%	24.0	Clear	
5-Jul							
6-Jul	11:00	63		90%	24.0	Clear	
7-Jul	8:30	60	10	65%	23.0	Clear	
8-Jul	12:00	57	13	80%	23.0	Clear	
9-Jul	12:00	61	13	20%	22.5	Clear	
10-Jul	12:00	60	13	50%	22.0	Choppy	
11-Jul	12:00	55	13	100%	21.5	Choppy	
12-Jul	12:00	50	13	100%	20.5	Choppy	
13-Jul	17:00	60	14	50%	20.0	Clear	
14-Jul	12:00	50	14	100%	20.0	Clear	
15-Jul							
16-Jul	12:00	60	12	25%	19.5	Clear	
17-Jul	12:00		12		19.0		
18-Jul							
19-Jul	12:00		14		18.0		
20-Jul			15		17.5		
21-Jul			16		17.0		
22-Jul			16		19.5		
23-Jul			15		19.0		
24-Jul			14		19.5		
25-Jul			12		19.5		
26-Jul			13		17.5		
27-Jul			14		17.0		
28-Jul			14		16.5		
29-Jul			12		16.0		
30-Jul			13		16.0		
31-Jul			13		16.0		
1-Aug			11		26.0		
2-Aug			11		21.5		
3-Aug			10		25.5		
4-Aug			10		24.0		
5-Aug			10		22.0		
6-Aug			10		20.5		
7-Aug			11		20.0		
8-Aug			9		20.5		
9-Aug			9		20.0		
10-Aug			9		19.5		
11-Aug			9		26.0		
12-Aug			9		27.0		

Figure 1. Area location map of the Nome River weir project site, Norton Sound, 1998.

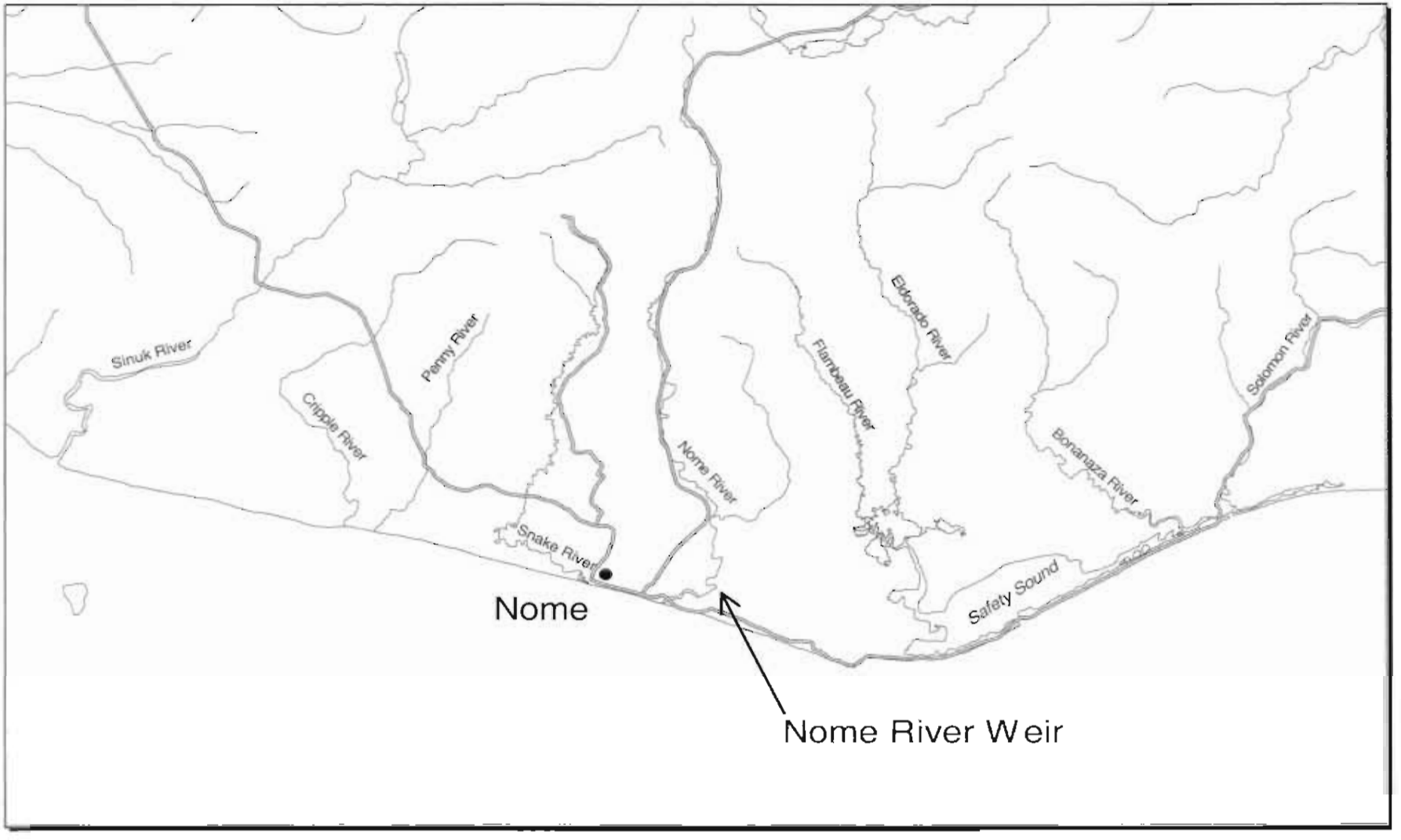

Figure 2. Daily chum salmon migration past the Nome River weir, Norton Sound, 1998.

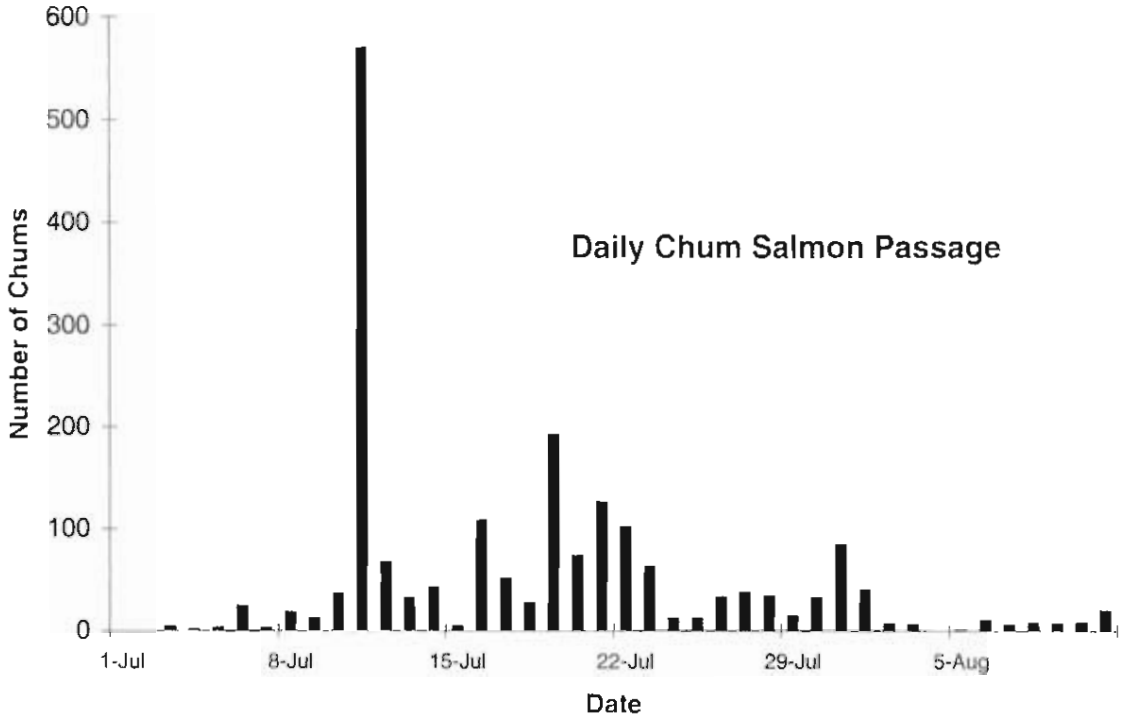

Figure 3. Cumulative chum salmon migration past the Nome River weir, Norton Sound 1998.

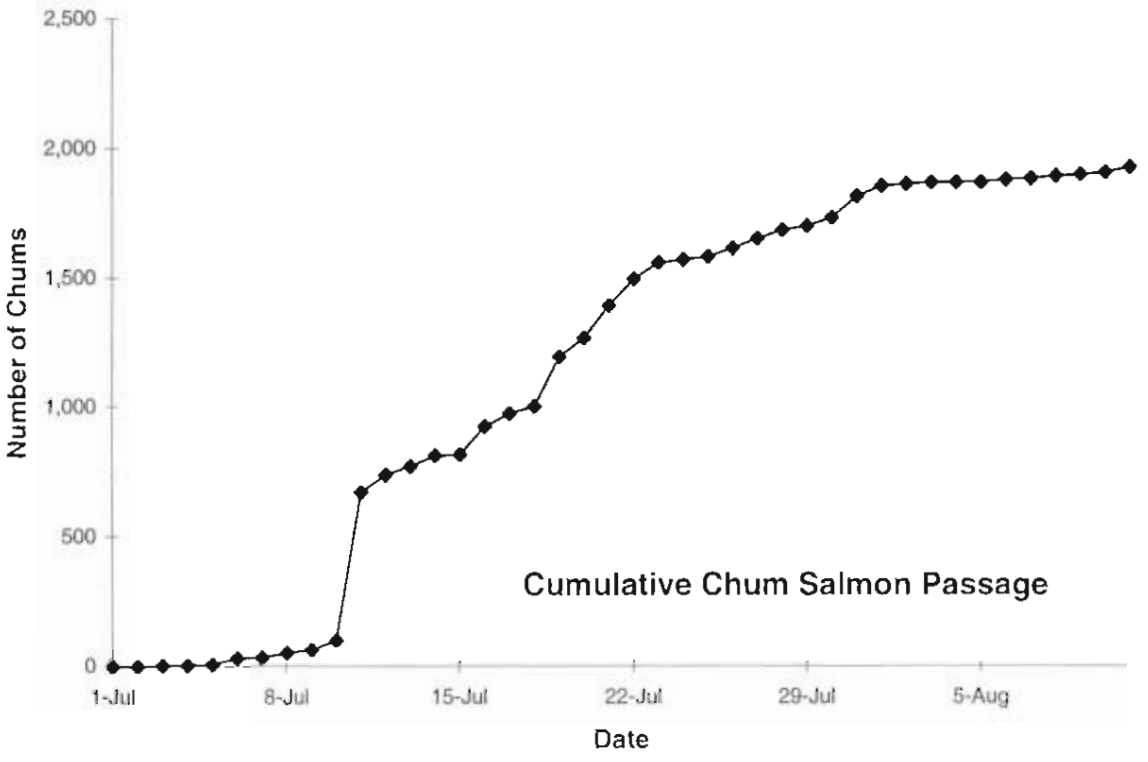

Figure 4. Daily pink salmon migration past the Nome River weir, Norton Sound, 1998.

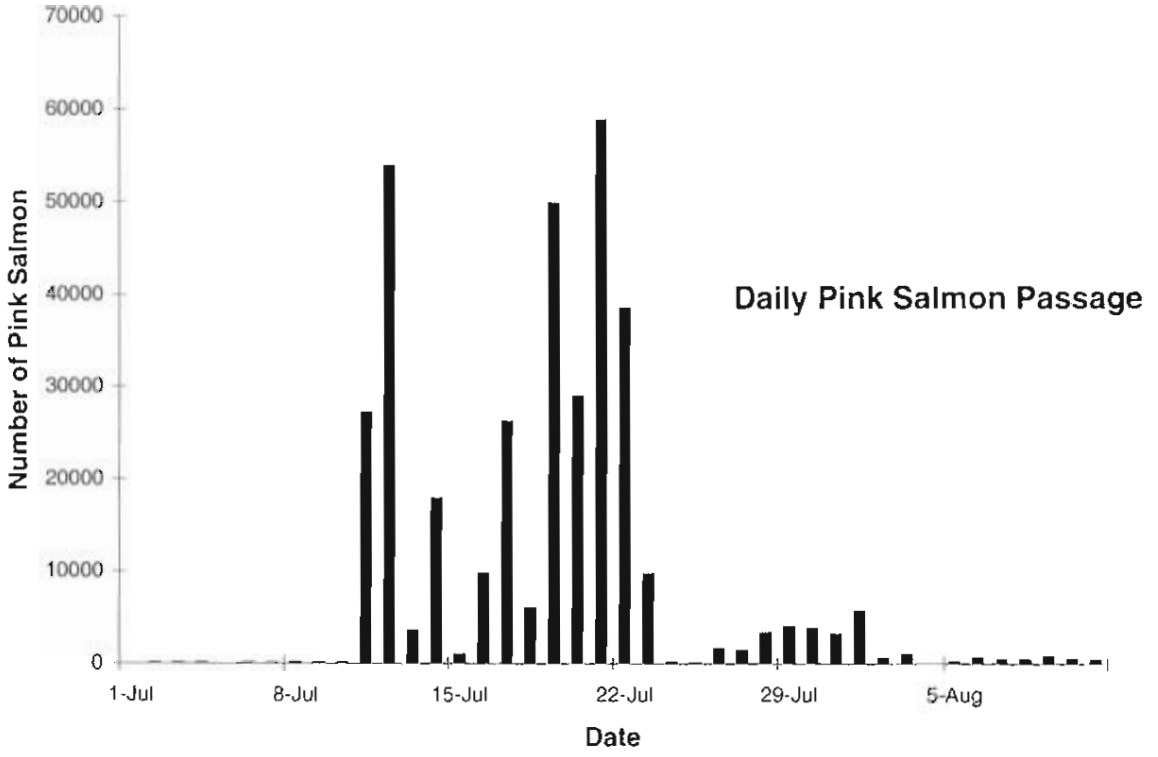

Figure 5. Cumulative pink salmon migration past the Nome River weir, Norton Sound, 1998.

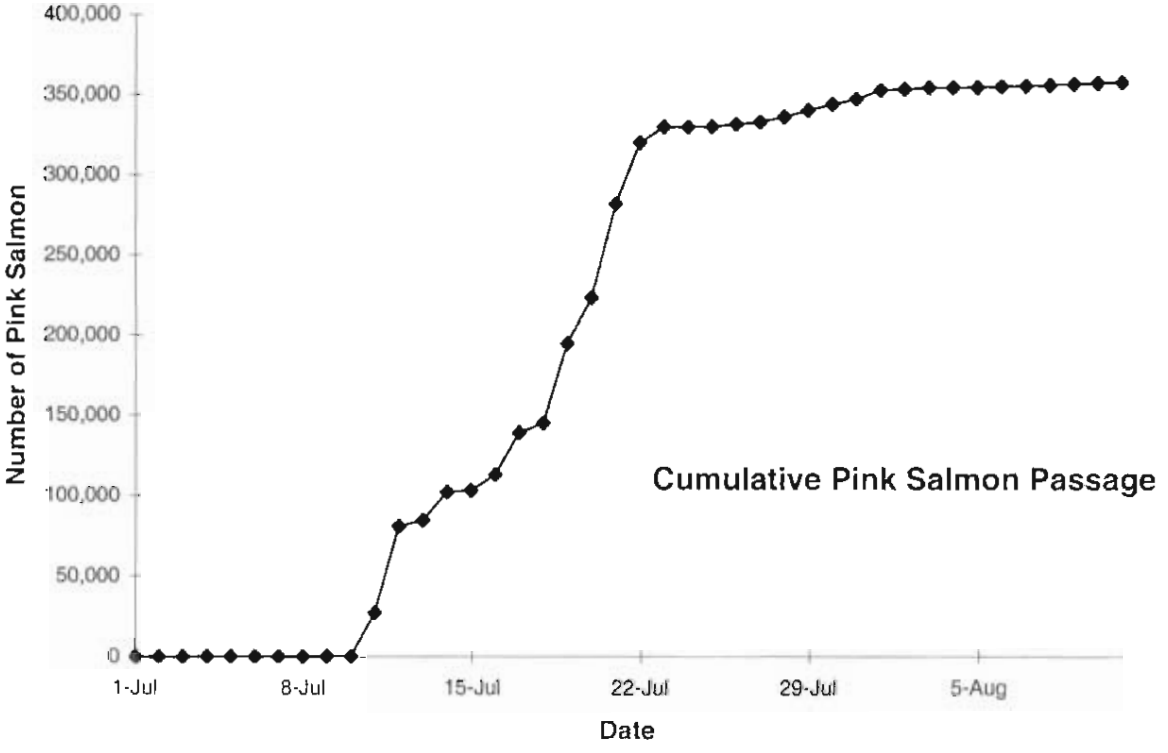

Figure 6. Daily king salmon migration past the Nome River weir, Norton Sound, 1998.

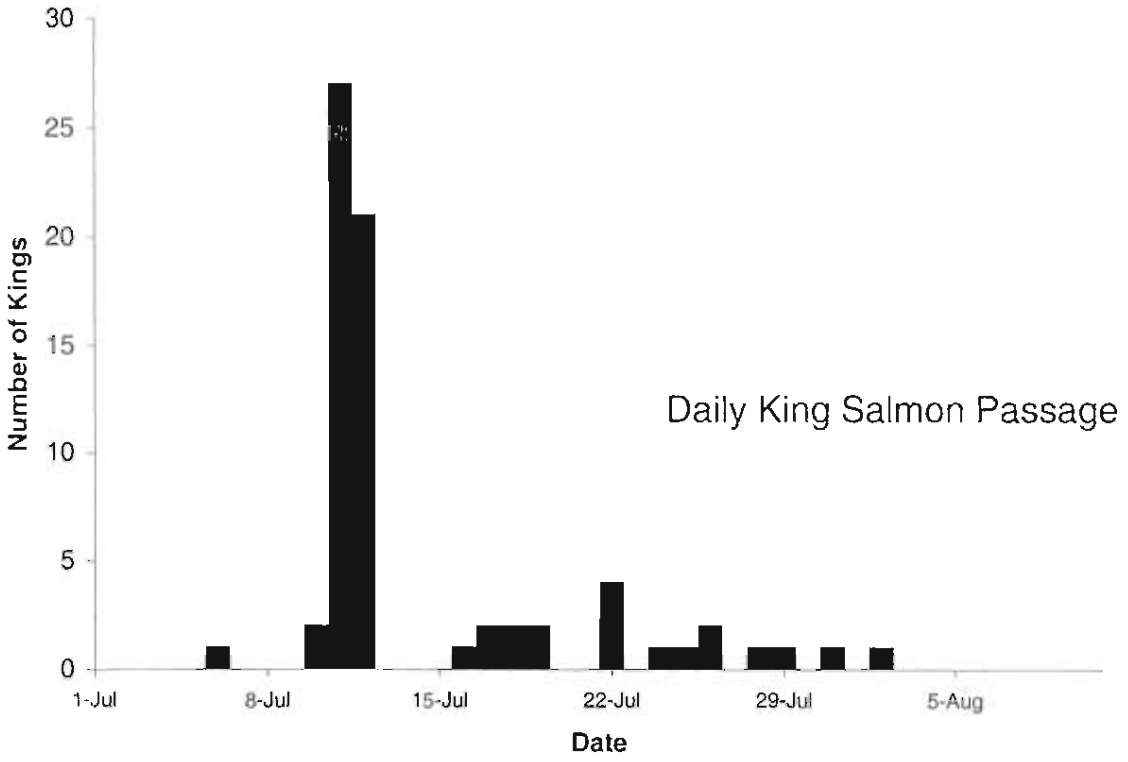

Figure 7. Cumulative king salmon migration past the Nome River weir, Norton Sound, 1998.

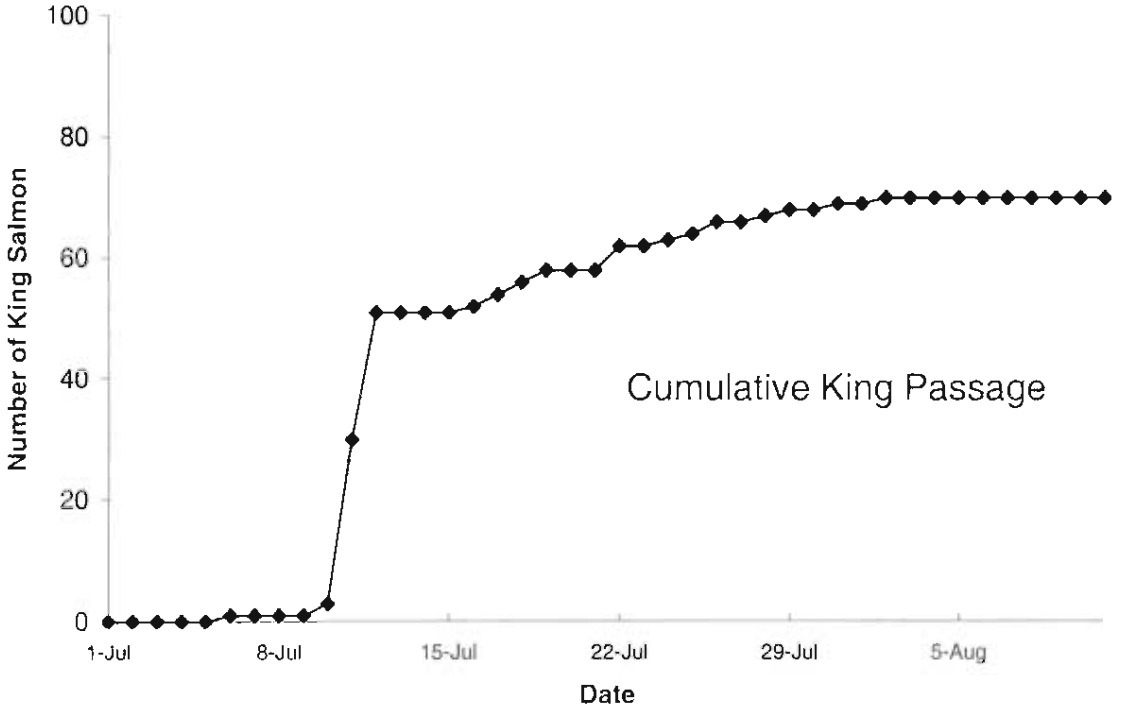

Figure 8. Daily coho salmon migration past the Nome River weir, Norton Sound, 1998.

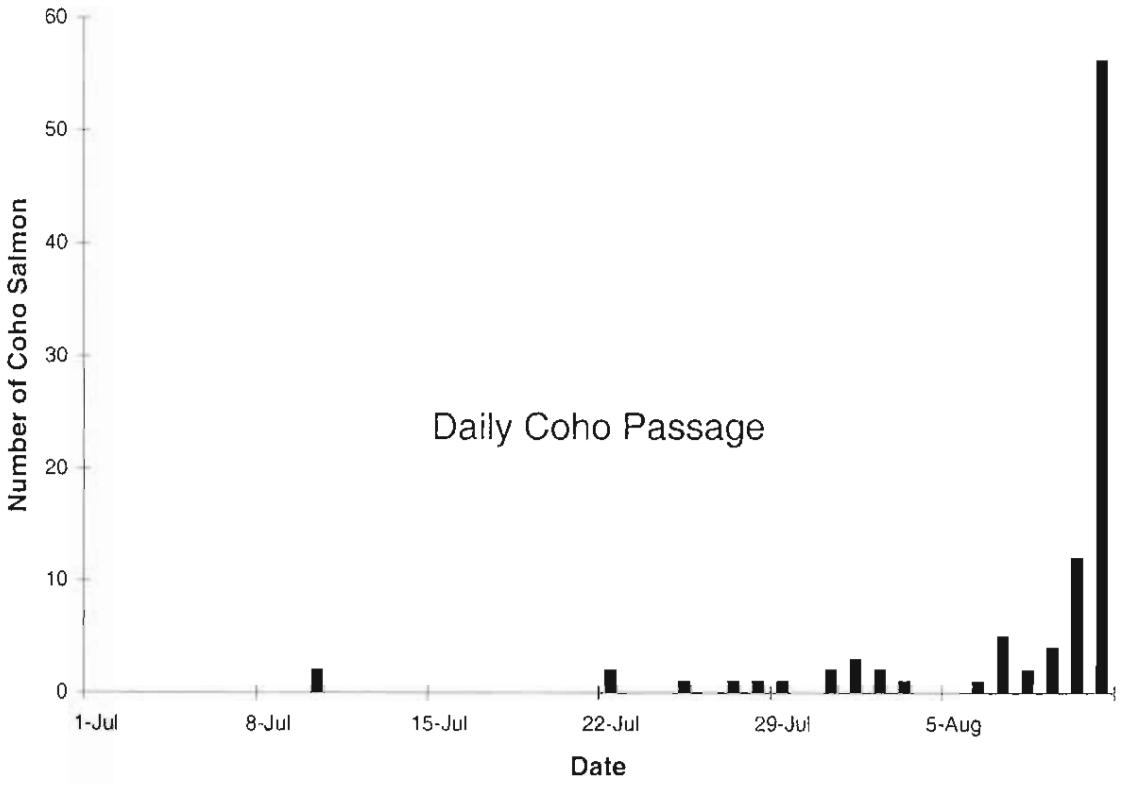

Figure 9. Cumulative coho salmon migration past the Nome River weir, Norton Sound, 1998.

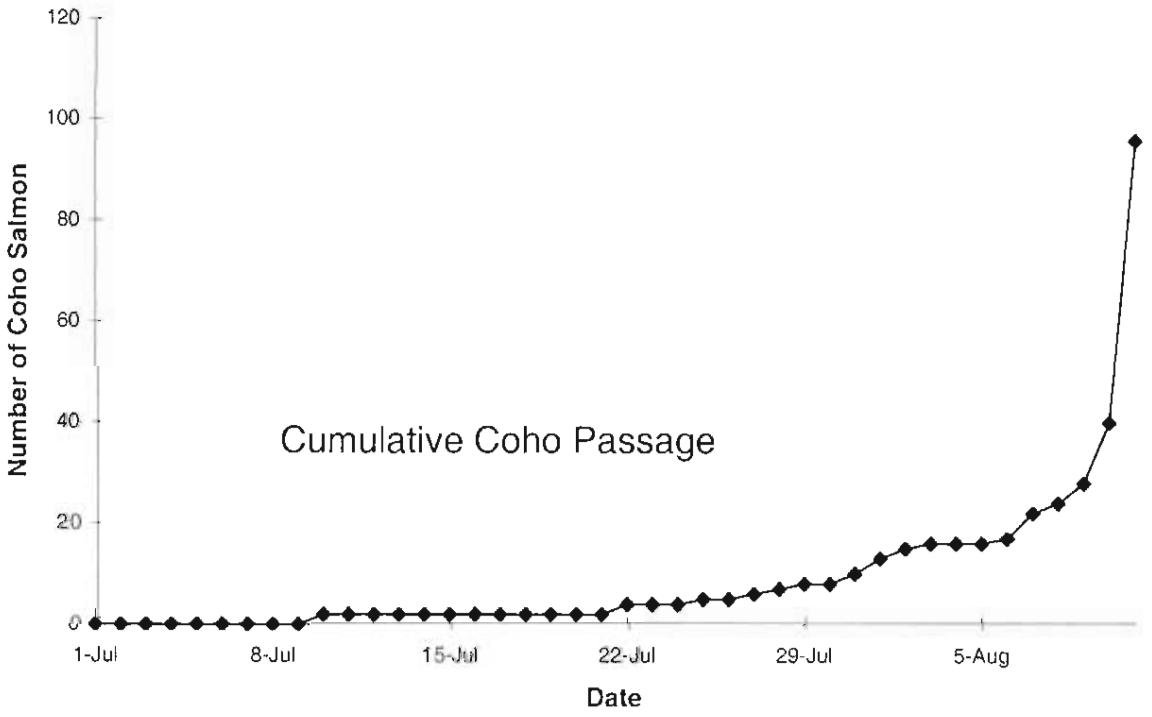

Figure 10. Daily Dolly Varden migration past the Nome River weir, Norton Sound, 1998.

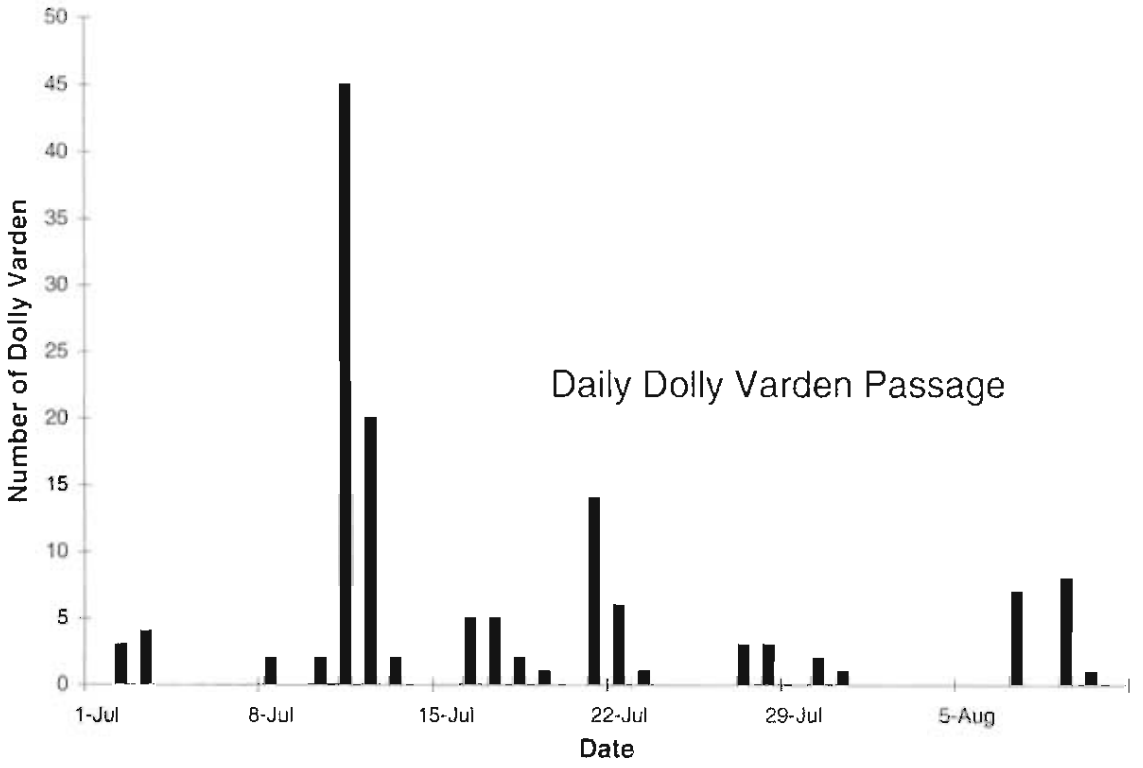

Figure 11. Cumulative Dolly Varden migration past the Nome River weir, Norton Sound, 1998.

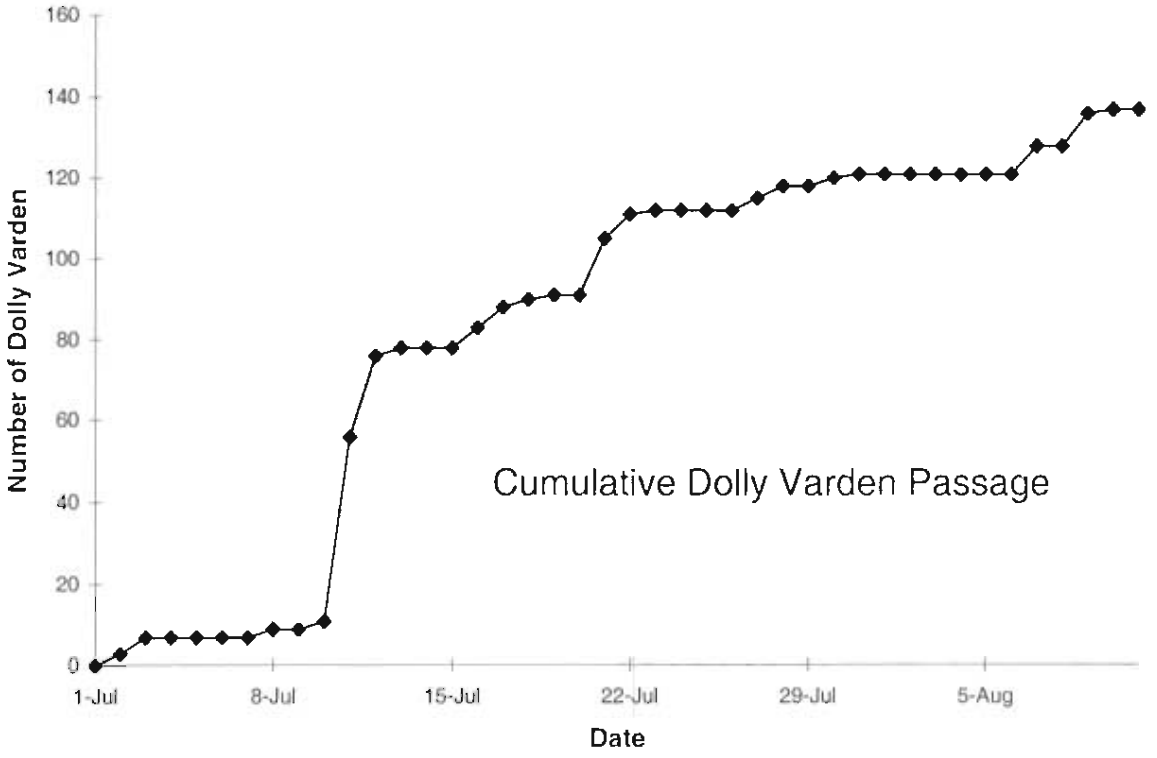

Figure 12. Cumulative passage of chum salmon past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1998, Norton Sound.

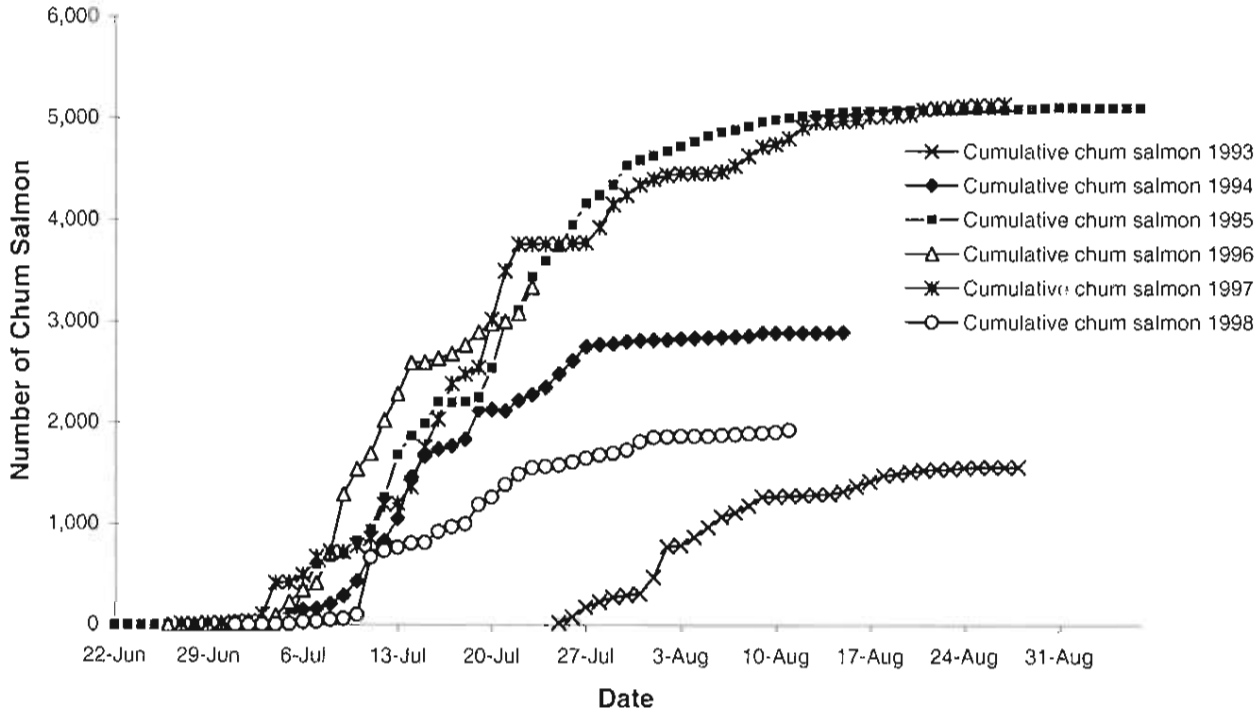

Figure 13. Cumulative odd year pink salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1997, Norton Sound.

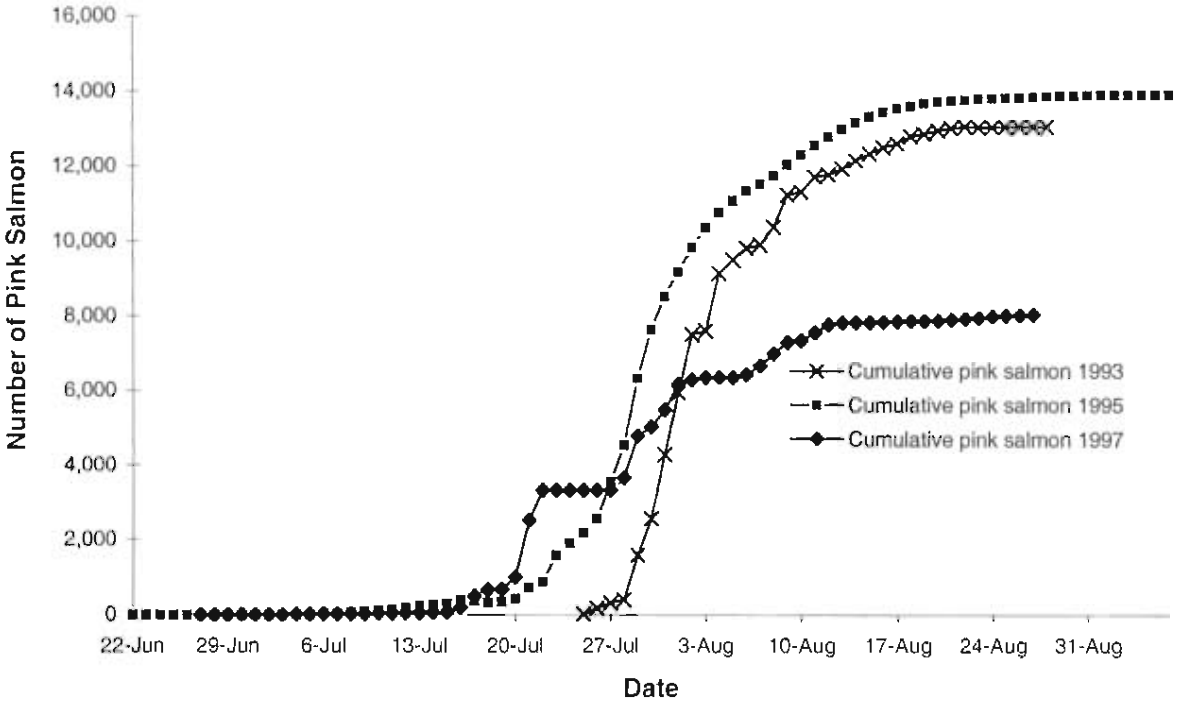

Figure 14. Cumulative even year pink salmon migration past the Nome River counting tower, 1994, and the Nome River weir, 1996 and 1998, Norton Sound.

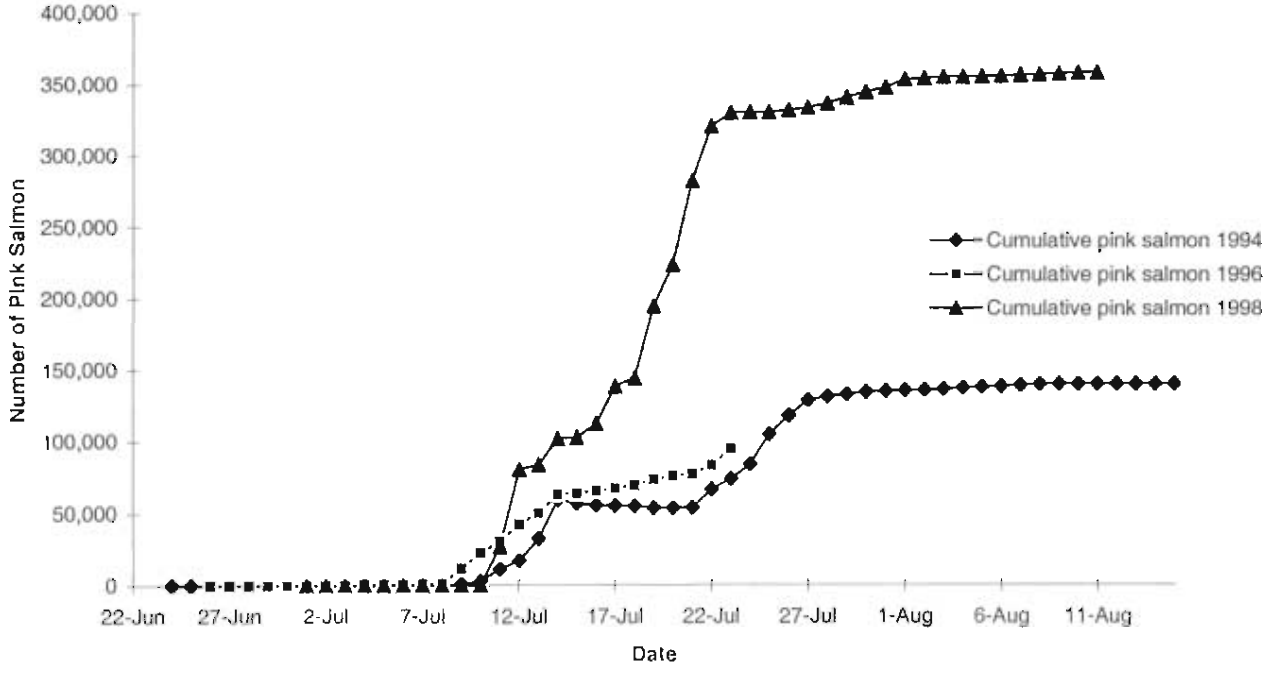

Figure 15. Cumulative king salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1998, Norton Sound.

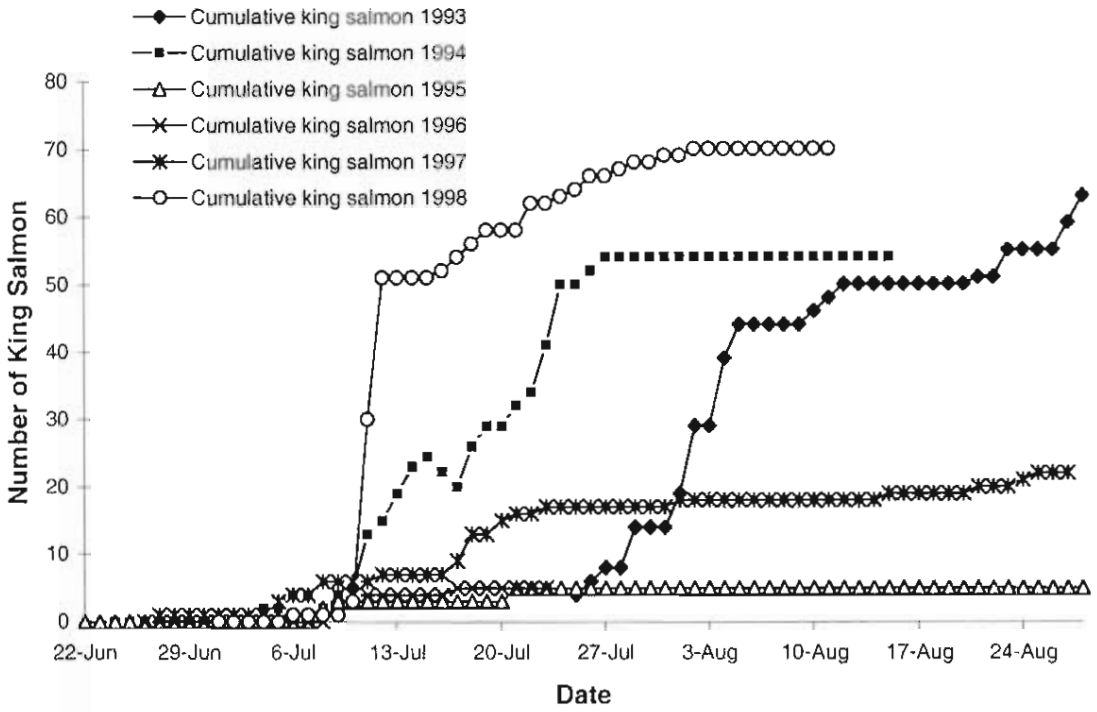

Figure 16. Cumulative coho salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1998, Norton Sound.

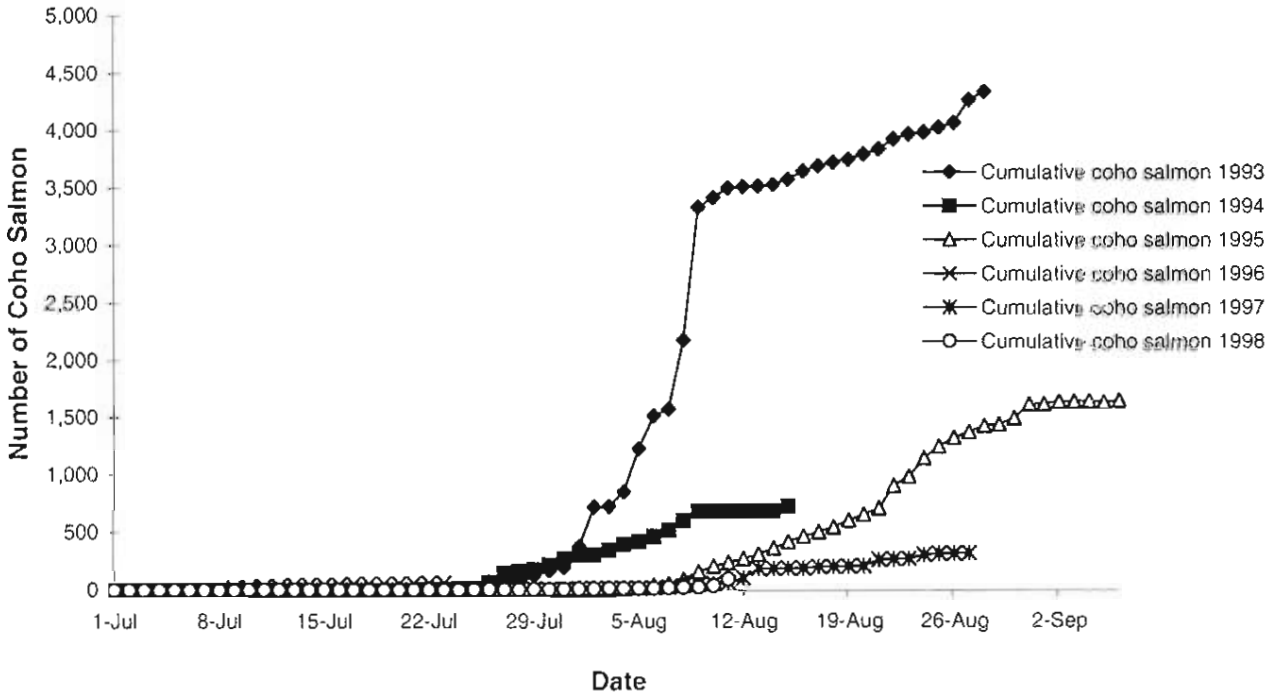

Figure 17. Cumulative Dolly Varden migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1998, Norton Sound.